

## WHAT IS CLAIMED

1. A solar simulator comprising:
  - a pulsed radiation source for generating electromagnetic radiation;
  - at least one mirror element arranged in a region of said radiation source, said at least one mirror element being structured and arranged to reflect components of radiation from said radiation source essentially in an intended irradiation direction,
  - said at least one mirror element, formed at least in part of metal, being positioned adjacent to said radiation source and being structured to receive at least a part of an ignition voltage of said pulsed radiation source.
2. The solar simulator in accordance with claim 1, wherein said intended irradiation direction corresponds to an irradiation direction of said solar simulator.
3. The solar simulator in accordance with claim 1, wherein said at least one mirror element is a planar element.
4. The solar simulator in accordance with claim 1, wherein said at least one mirror element comprises a material or coating having a reflection effect that is much higher in an infrared range than in a UV range.
5. The solar simulator in accordance with claim 4, wherein said coating is composed of gold or gold-containing alloy.
6. The solar simulator in accordance with claim 5, wherein at least parts of said at least one mirror element are made of gold.
7. The solar simulator in accordance with claim 1, wherein said at least one mirror element comprises either a semiconductor layer with an oxide layer or a metal layer with an oxide layer.
8. The solar simulator in accordance with claim 7, wherein said semiconductor layer with an oxide layer comprises silicon and said metal layer with an oxide layer comprises a light metal.

9. The solar simulator in accordance with claim 1, wherein said radiation source comprises a element having a longitudinal extension that is structured and arranged in a curved manner along said longitudinal extension.

10. The solar simulator in accordance with claim 9, wherein said element is formed in a ring-shaped or helical manner.

11. The solar simulator in accordance with claim 1, further comprising a housing structured and arranged to surround said radiation source; and

said housing comprising a plurality of screen elements arranged one behind the other, relative to said irradiation direction, in a wall area.

12. The solar simulator in accordance with claim 11, wherein said plurality of screens are composed of a low reflection material or are coated with a low reflection material.

13. The solar simulator in accordance with claim 11, wherein said plurality of screens are structured and arranged to absorb scattered radiation.

14. The solar simulator in accordance with claim 11, wherein said plurality of screens are movable in planes perpendicular to said intended irradiation direction.

15. The solar simulator in accordance with claim 14, wherein said plurality of screens are movable independently of each other.

16. The solar simulator in accordance with claim 14, wherein each of said plurality of screens absorb different radiation components.

17. The solar simulator in accordance with claim 14, wherein each of said plurality of screens absorb same radiation components.

18. The solar simulator in accordance with claim 1, further comprising a carrier plate, wherein at least one of said radiation source and said at least one mirror element is connected to said carrier plate via holders.

19. The solar simulator in accordance with claim 18, wherein said carrier plate is composed of granite.

20. The solar simulator in accordance with claim 1, wherein said at least one mirror directly abuts said radiation source.

21. The solar simulator in accordance with claim 1, wherein said radiation source comprises a xenon flash lamp.

22. A process of operating the solar simulator according to claim 1, said process comprising:

applying a voltage to the radiation source that is below an ignition voltage of the radiation source; and

applying an ignition voltage to the at least one mirror, whereby a pulsed discharge is produced in said radiation source.

23. The process in accordance with claim 22, wherein a voltage source applies the voltage to the radiation source and an ignition coil applies the ignition voltage.

24. A process of operating a solar simulator, said process comprising:

applying a constant voltage to a radiation source that is below an ignition voltage of the radiation source; and

applying an high voltage to the at least one mirror positioned adjacent the radiation source, whereby a pulsed discharge is produced in said radiation source.

25. The process in accordance with claim 24, wherein the at least one mirror is positioned to directly abut the radiation source.

26. The process in accordance with claim 24, wherein the radiation components emitted by the radiation source are directly directed or reflectively directed in an intended irradiation direction.

27. The process in accordance with claim 26, further comprising reflecting more radiation components in an infrared range than in a UV range.

28. The process in accordance with claim 24, absorbing scattered radiation with filters arranged downstream from the radiation source, relative to the intended irradiation direction.

29. The process in accordance with claim 28, further comprising moving the filters in planes perpendicular to the intended irradiation direction.